



PVRC Newsletter

October

Newsletter Editor: John K3TN jpescatore@aol.com

Website: <http://www.pvrc.org>

Meeting Info: <http://www.pvrc.org/chapters.htm>

Facebook: <https://www.facebook.com/groups/PotomacValleyRadioClub/>

President's Letter – Doug AA3S

As a result of their superb contesting efforts through the end of the 2022-2023 5M Contest Season, six PVRC members achieved the 5 Million Point milestone for the first time! Unfortunately, two of them had not updated their PVRC Roster data for address and email and as a result their new plaque was returned to me as undeliverable (no forwarding address).

Important: check to see if your contact data are in the PVRC Roster correctly! Also, as a big part of keeping in touch with PVRC news, if you know a PVRC member who is not signed up for the PVRC Reflector, please encourage them to do so. PVRC Election nominations are open through the end of October, see the PVRC Reflector for details.

The ARRL Sweepstakes has been an important must-win contest since PVRC's beginnings in 1947. The brand-new larger circle for ARRL contests allows many more participants for the clubs that compete with us. If our newly qualified participants do not enter their Sweepstakes points for PVRC then we can expect to lose (think FRC or SMC). **DOUBLE 5M POINTS** for this year's Sweepstakes!

Both legs of Sweepstakes are in November, it will be here before you can ask "QRZ?"

Go PVRC!



Club Competition - Doug AA3S

At least four State QSO parties in October have Club Competitions that PVRC could win. If PVRC does win a club award and you have the highest point contribution for that club win, then you are eligible to receive whatever physical award PVRC receives from the sponsor!

California QSO Party	10/7/2023	CQP Home Page
Arizona QSO Party	10/14/2023	Arizona QSO Party
PA QSO Party	10/14/2023	PA QSO Party
New York QSO Party	10/21/2023	NY QSO Party

If you have tips for scoring big in these contests please post on our Reflector!

October has two 5M contests, *one has no circle*. Use our [5M calendar](#) to start your planning for these!

- 1) Worked All Germany PVRC Members Worldwide = No Circle! 2023-10-21
- 2) CQWW SSB ARRL/CQ 250-Mile Circle 2023-10-28

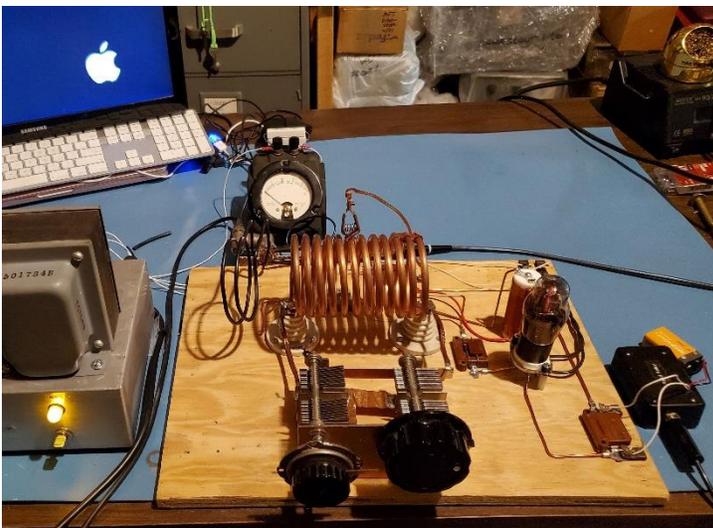
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Antique Radio Contesting – Bruce WK3A and Dan K2YWE

The Antique Wireless Association has several on air events, essentially contests for hams owning and operating various forms of antique radio – look [here](#). At least two PVRicers are active in antique radio contesting, in this case the Bruce Kelly Memorial CW QSO Party:

Bruce WK3A: This operating event requires 1929 Style Power Oscillators TX power limited to 25w. Tubes must be from 1929 or earlier. Most are Hartley type, with a few Colpitts and “TNT” which is a “tuned plate/ untuned grid circuitry. I participate with 3 Transmitters all built by myself, from period parts when possible: 160m, 80m and 40m. An extremely hardy bunch of friends try 20m with some success, 100 year old triode audio tubes are real fickle at 14mhz.

This is also my favorite contest, I also got Dan K2YWE to build something last year! Certificates for most contacts (around 50 or so), most miles per watt, and most “authentic” sounding note. I placed second last year with 52 QSO’s.



Dan K2YWE: The 1929 Hartley I built for the AWA event.

The Expanded PVRC Circle Snags Marty W8AKS

From Marty W8AKS in Beckley WV:

I just read the September newsletter and was thrilled over the ARRL new club radius limit for contesting. This puts me back into the circle and really stokes my interest now that my scores mean something for the 5M award.

I've redone my station and I am looking at possibly having to move into an independent living situation. The local one has okayed the erection of my [ZeroFive](#) groundplane. This is my new station layout:

- **Transceiver:** Flex 6400M, Backup: IC7100 (used primary for 2m mults)
- **Amp/Tuner :** Elecraft KPA500A/500T
- **Antennas:**
 - HF ZeroFive 40-10 ground plane
 - 80M Inverted V
 - 40 & 20 Inv V
 - WARC Band Fan Dipole (no use for contesting)
 - 6M: 5 Element LPF Innov Beam at 28 ft
 - 2m/430: MFJ 3 element beam at 20ft (due to be raised to 30 ft)

At age 82, I am trying to make one last (hopefully not) hurrah at contesting. RTTY is about the best mode I can do due to hearing loss but I can get on for some points in all the modes.

Anyway, that is the situation in WV. I'll be in the CQWW RTTY in October. The amp is not hooked up yet. So, I may be LP.

Don't Miss the Solar Eclipse QSO Party

Complete, detailed rules for the SEQP can be found [here](#).

Dates and Times:

14 Oct 2023 1200 – 2200 UTC (Partial eclipse begins ~1500 UTC in Oregon ends ~1840 UTC in Texas)

8 Apr 2024 1400-2400 UTC (Partial eclipse begins ~1710 UTC in Texas and ends ~2040 UTC in Maine)



Participants are encouraged to operate before, during and after the eclipse passes over the continental US. Doing so will create baseline data (pre- and post-eclipse), and eclipse influenced data (during annularity or totality) for the research team.

The Solar Eclipse QSO Party (SEQP) is unique among ham radio competitions as it awards points for two-way QSOs (ham to ham contacts via radio) and bonus points for reception reports from skimmers, RBN nodes and the like.

Parks on the Air (POTA) Operation – Tripp N4NTO

I have enjoyed contesting during most of my ham career, which started in 1985 while in high school. I have been involved in several facets of ham radio, but contesting is where my heart is. Joining PVRC was in the back of my mind for several years, but I never made the trek to Raleigh for the 2 required meetings. Enter Covid and Zoom, and Voila! I am having a grand time being a fairly active contributor of scores to PVRC, and certainly enjoying all the comradery of fellow PVRCers.

The drawback to contesting is having to wait for the contest. POTA has no set times or modes. You can activate any mode, at any time. It starts when you go out to the park and call CQ. It continues until you have had enough and you politely QRT, or if your battery gives out, you are done. The POTA awards program is incredible. You simply upload your logs, and the system does the rest of the work. Very little secretary work is necessary, unless you use a paper log and transcribe the log later. I use [Hamrs](#) on my phone to log.

POTA adds an adversity factor to your skillset. If you are successful in activating a POTA park with the heat, cold, bugs, and rain, contesting in the comfort of your home is a breeze! After a few POTA activations, and returning to a regular contest, I noticed my rates started steadily increasing. Thus, I am submitting better scores. POTA has taught me speed and efficiency, but not great contest scores, as POTA hasn't taught me to keep my BIC. If feeling really adventurous, you can certainly go contest in a POTA park for both POTA and contest credit! I often times enjoy doing the Wednesday afternoon CWTs, the Monday afternoon MSTs, and the Friday afternoon SSTs from a POTA park! An afternoon CWT at the POTA Park is a real workout with my POTA rig that has no automation. It is just the key and me.

My POTA rig is a much scaled-down version of what I run at home. I run a Yaesu FT-897 from a Bioenno 12aH battery, to a 49:1 balun. I found 20 watts to be a sweet spot. I am not patient enough for QRP, yet want enough battery time to do all I want. At my home park (K-6956 Tar River State Game Land) I keep a 66' surplus telephone wire running up a pine tree. I pull my truck up under the pine tree, hook the balun onto the wire, and I am on the air. When I am finished, I unhook the wire, tie it back to the tree, and go home. The winter setup is inside the truck with the rig on the passenger seat. In hot weather, the shack is on the toolbox of the truck. I keep a 66' wire on a spool for adventures to less-visited parks.





I have purchased a Chellegence MC-750 vertical, which works great when down at the cottage, and I strike out as N4NTO/MM on the Western Albemarle Sound, which is a 2-fer - K-6880 Batchelor Bay Game Land, and K-0418 Roanoke River National Wildlife Refuge. On the POTA Facebook page, Stella, my POTA Pup, and I were referred to as “a branch of the POTA Navy”. Thanks to K3YDX, I have added a surplus 45aH battery and now have to charge up only about once a month.

POTA and contesting are closely connected. There are many hams out there in the parks. Go, check it out! I bet there is a park out there close to you.

Fowlfest 2023 – Jim N3JT



Something to Laugh At – Alan WA3EKL

As a very young man I always liked to build things out of wood, paper, and metal. At 8 years old I started in electronics and tried to make a code practice oscillator out of a homemade Morse code key, a speaker out of an old radio and 115 volts AC. I think I got out one good dit before the speaker smoked.

I also became easily frustrated when something I had built did not work the way it was supposed to. My mom told me one day “Son, you have to learn to laugh at yourself.” So, as you read the following you can laugh with me or laugh at me but there will be some wisdom at the end.

My radio room has reasonable modern-day equipment for contesting but my computers are, as my oldest son says, archaic. So over the past few years I have been slowly replacing the core two Duo desktops with Small Form Factor (SFF) computers that have external plug-in power supplies; one of which has been running for about 3 years and seems to be impervious to RFI in the radio room. I recently replaced the two main HF station computers with SFF computers of the exact type that the RFI had no effect on.

The weekend of the Maryland QSO Party was to be the shake down test for the two new/used computers. The computer on station B which was running 20 meters performed flawlessly. The other computer on station A did not - yet A and B are both exactly the same and duplicates of the computer that is having no RFI problems.

Nowadays our Amateur Radio programs try to force us to use one single cable between our computers and our transceivers to perform every function. That USB cable must carry the command data from our computers to our transceivers, the polling data from our transceivers to our computer programs, activate our transceivers to go into and out of transmit, pass audio wave files in SSB mode programs or digital programs, pass CW signals to the transceiver, plus pass received data signals to the computer for decoding. All that data must flow in a precise sequence which must be programmed into each of our Amateur programs. For example, you want your transceiver to go into transmit before the digital data is sent not after it is sent! There is a potential problem with that one wire system. If RFI breaks the sequence of any part of that data stream, then our programs usually stop functioning and necessitate a program reset or a complete computer reset. Those resets waste valuable time especially during any contest.

Many years ago, I separated the command / polling data, the audio sound, the keying function and the computer generated CW signal into four separate lines. I do not use Computer Assisted Transmitter (CAT). Most of our programs like WSJTx and N1MM allow the transceivers to be keyed through a user-selected com port. The .wav files can come from your sound card and be directed into your mic input with a relay which can also be a part of the transmitter keying system. The program generated CW signal can also be sent out a non-user-selected com port on the RTS or DTR pin. Personally, I use the RTS pin to key my transceivers and the DTR pin to send the program generated CW signal.

During the MD QSO Party the RFI affected computer “A” would lose the command/polling link with the N1MM program. I could no longer do instant band changes and I lost the VFO frequency lock. However, I could still use all the “F” key

voice files, key the transceiver and all the contest data would go into the N1MM program with no issues.

I theorized the RFI was getting into the com port to com port line between the computer and the K3 transceiver since the control and polling data was carried on this cable only. Now the laughing part starts. Bear in mind the 20-meter operator is steadily running stations with another K3 driving an SB221 amp while I am trying to solve this issue. My first attempt was to put clamp on ferrite chokes on each end of the com port to com port line. This K3 still has the original RS232 nine pin com port. The new computer has no com ports, only USB ports so the line coming from the K3 goes to an RS232 FTDI chip, adapter to USB cable. We will get back to this later. At the time the issue was happening the program I wrote to allow me to control and key any of my K3's with both WSJTx and N1MM at the same time was giving me a specific error, which I believed had something to do with baud rate. After I applied the chokes I reduced the com port baud rate in Windows, in N1MM, and in the K3 from 38400 to 19200 hoping that would fix the issue. After those changes N1MM would lock up with the K3 for about 40 seconds and then lose the link. So, I said "RFI is still getting in somewhere."

I then reset everything back to 38400 because I realized my program was set up for 38400 and I was not about rewrite a program in the middle of a contest just to test a theory. My next attempt was to choke the two remaining USB lines and see if the 20 meter station was still unlocking the system. Sure enough, the system was still unlocking or so I thought. USB lines are notorious for RFI problems. Next, I choked the network cat 5 cable going into the computer. Still no joy. In every case the system would lock up for about 30 to 40 seconds then fail. The N1MM Band map would show that red bar at the top saying Reset Radio. After I reset my program then I could reset the Radio which would work for about 30 seconds and the Red Bar would reappear. The 20-meter op is still going strong. The keyboard, mouse, both in and out audio lines already had chokes on them from the previous computer. The only thing left was the power cord and the monitor cable.

I then started pulling out of the back of the computer one cable at time, resetting the system with each cable pull, attempting to find which cable was allowing the RFI into the computer. I got down to only the power cable, the monitor line, mouse, keyboard and the com port line running to the K3 still plugged in. Then the 20-meter operator announced he needed a break. Wait for it! He went upstairs and I reset everything and in 40 seconds the system lost lock. I reset it again and it unlocked again. Then it hit me. The 20-meter station was not transmitting, nor any other station. I said, "Why is this thing still unlocking?" After a little thought I had an idea which I immediately checked out. Remember I said I had reset everything back to 38400? Well, I forgot to reset the K3 baud rate in the transceiver back to 38400. When I reset the K3's baud rate back to 38400 the system locked up immediately. I left it locked up and I took a break upstairs. The 20-meter op went back down stairs to the radio room and began running contacts again. Thirty minutes later when I came back down stairs computer A and N1MM were still locked, running fine and did so the remainder of the contest.

Most likely the first two chokes on the com port to com port line fixed the problem. I complicated the matter by changing the baud rate of the comports and wasted all that time looking for a problem that no longer existed.

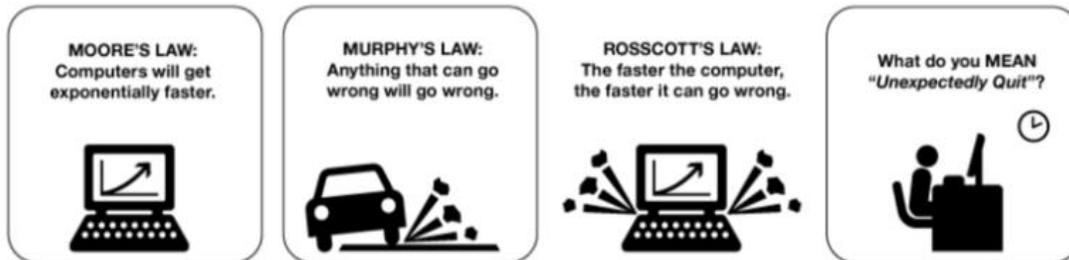
The next morning after the contest I had this thought. The original computer had two nine pin com ports like the K3 and the cable between the two was shielded with the metal cases of each end grounded to the cable shield. I know because I constructed the cable. When I installed the new computer, I had to attach an RS232 to USB adapter to one end of that cable and plug the USB end into the computer. The USB end is plastic and not grounded to the computer case. Also, a USB cable only has 4 wires in it. Two wires are for power + and – if needed. The other two wires carry all the data which is nothing but a string of ones and zeros. You can see how easily the data in that cable can get corrupted. Since the cable is not grounded at each end anymore, most likely this is how the RFI was entering the computer and affecting the data flow. The only way to stop it was by choking it out before it got into either device at each end of the cable.

The wisdom of this exercise for me is twofold. First, when something goes wrong in a contest don't react so quickly. Stop, relax, and think about it for a while before making any adjustment. The second thing which I did wrong, and I know better is; when you are troubleshooting **never** make two changes at the same time.

I hope you all had a good laugh.

The System

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PVRC RTTY/Digital DXCC Standings – Frank W3LPL

Below are the RTTY/Digital DXCC totals for PVRC members, transcribed from the ARRL DXCC data as of the 20th of each month or so. Thanks to Frank for the data each month to make this a regular feature. Please report any call sign omissions or errors to [Frank](#).

Call	DXCC	Call	DXCC	Call	DXCC
K3WC	353	K3JT	265	W3MAM	107
K4FJ	349	K0GD	261	N4ZH	100
W4PK	348	W8AKS	259		
N2QT	345	N3QE	252		
K3SWZ	342	K3TN	247		
W3UR	342	N3RC	245		
W4DR	341	N3KN	238		
W3OA	337	W3MR	235		
W3LL	331	W3FOX	232		
N3NT	329	W3DF	229		
K2PLF	327	K1AR	228		
K4CIA	327	W3US	227		
K5EK	327	N4JQQ	226		
K1HTV	326	N4NW	221		
N3KK	323	AA4NC	219		
WX4G	323	K5RT	215		
K3WA	322	KU1T	210		
K4SO	316	WB3AVN	209		
K3SX	315	W3DM	197		
N4DB	315	N3ND	190		
W0YVA	314	K3WI	188		
W3KX	313	KE4S	186		
N3MN	305	NR4M	185		
N4MM	305	N4XYZ	174		
K1GG	304	K3KY	172		
K5VIP	304	K3PU	171		
W4VIC	298	W3LPL	168		
KA4RRU	295	KG7H	168		
K4WNW	295	N4GU	163		
KG4W	294	NA1DX	162		
W3GG	293	KF7NN	161		
N4TL	292	N6DW	155		
W3BW	289	N3AIU	143		
W2GG	281	K4HQB	142		
W2YE	277	NE3K	120		
WS6X	274	K3IXD	114		
W3IP	266	N3COB	112		

Membership News – Tim N3QE

Chapter leaders please remember to complete the [Meeting Attendance Report](#). Members can check and update their roster details via the [Roster Lookup](#).

Upcoming Contests – from [WA7BNM](#)

October 2023	
+ Collegiate QSO Party	0000Z, Oct 7 to 2359Z, Oct 8
+ Oceania DX Contest, Phone	0600Z, Oct 7 to 0600Z, Oct 8
+ California QSO Party	1600Z, Oct 7 to 2200Z, Oct 8
+ DARC RTTY Sprint	1800Z-1929Z, Oct 10
+ Oceania DX Contest, CW	0600Z, Oct 14 to 0600Z, Oct 15
+ Stew Perry Topband Challenge	1500Z, Oct 21 to 1500Z, Oct 22
+ Worked All Germany Contest	1500Z, Oct 21 to 1459Z, Oct 22
+ CQ Worldwide DX Contest, SSB	0000Z, Oct 28 to 2359Z, Oct 29

RED – scores count towards PVRC 5M Awards or Challenge Program

Editor’s Last Word – John K3TN

Thanks to W8AKS, W3LPL, N3JT, WA3EKL, N4NTO, WK3A and K2YWE for contributions to this issue of the PVRC newsletter.

The winds and rain did not mix well with CQ WW RTTY at my QTH. My KPA 1500 amp was not happy with my OCF dipole and the high RTTY duty cycle. Looks like either water got into the center insulator or wet tree branches were slapping against the wire and causing rapid SWR changes – or both. The net results is the KPA 1500 first acting like a KPA 500 and then faulting. I’m waiting for things to dry out to start the debugging. I might be in the low power category for the fall contests if the big amp has to take a trip to Elecraft in California.

The quality and usefulness of the PVRC newsletter depends on contributions from members. If you have photos from club meetings, screenshots of new contest software, or writeups on station improvements or contest war stories, send them in any format to jpescatore at aol dot com.



From the PVRC Treasurer – Ted WA3AER

PVRC has chosen not to implement an annual dues requirement. We depend on the generosity of all our club members to finance our annual budget. In addition, active PVRC members are expected to participate and submit logs for at least two PVRC Club Competition contests per year.

When contemplating your donation to PVRC, each member should consider the benefit you are receiving from PVRC and its many opportunities for your personal growth in our wonderful hobby, then donate accordingly.

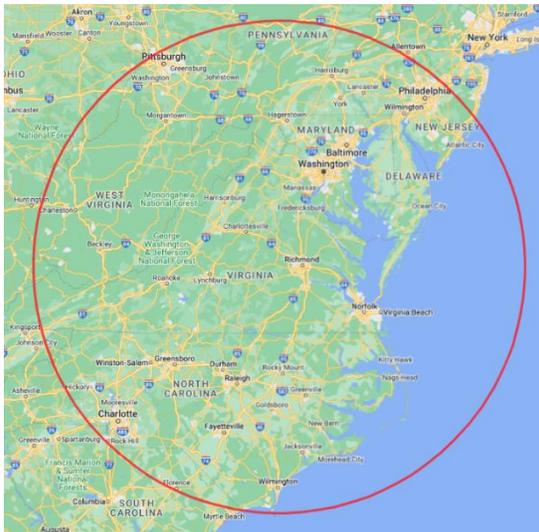
Direct donations to PVRC via Credit Card or PayPal may be made by clicking this "Donate" button and clicking the next Donate button that appears on your screen:



Donations to PVRC are not tax deductible

Eyeball QSO Directions

The latest info on local club meetings and get togethers will always be sent out on the [PVRC reflector](#) and posted on the PVRC [web site](#).



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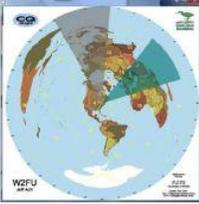
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Digital Atlas 4K

Geochron's Digital Atlas 4K gives viewers magnificent displays of the Earth with sunrise-sunset rendered in real time through a small computer that plugs directly into a 4K TV (not provided) via HDMI. Ham-friendly features include a Grey Line display; DX prefixes; and month, day, and hour of every time zone, including Zulu Time. Version II (GEO-400-1000B) comes with faster refresh rates, global weather overlays, live location of the International Space Station, and more. **Enter "Digital Atlas" at DXEngineering.com. \$449.00**



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Single or dual panadapter, plus a high-resolution tuning aid

The main panadapter can be set up as single or dual. Separate from the main panadapter is our per-receiver *mini-pan* tuning aid, with a resampled bandwidth as narrow as +/- 1 kHz. You can turn it on by tapping either receiver's S-meter or by tapping on a signal of interest, then easily auto-spot or fine tune to the signal.

Comprehensive I/O, plus full remote control

The K4's rear panel includes all the analog and digital I/O you'll ever need. All K-line accessories are supported, including amps, ATUs, and our K-Pod controller. The USB display output supports its own user-specified format. Via Ethernet, the K4 can be 100% remote controlled from a PC, notebook, tablet, or even another K4, with panadapter data included in all remote displays. Work the world from anywhere—in style!

K4 KEY FEATURES

Optimized for ease of use

Modular, upgradeable design

7" color screen with touch and mouse control

ATU with 10:1+ range, 3 antenna jacks

Up to 5 receive antenna sources

Full remote control via Ethernet



The K4 interfaces seamlessly with the KPA500 and KPA1500 amplifiers

'The performance of their products is only eclipsed by their service and support. Truly amazing!' Joe - W1GO



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IC-9700 | All Mode Tri-Band Transceiver

• VHF/UHF/1.2GHz • Direct Sampling Now Enters the VHF/UHF Arena • 4.3" Touch Screen Color TFT LCD • Real-Time, High-Speed Spectrum Scope & Waterfall Display • Smooth Satellite Operation



IC-718 | HF Transceiver

• 160-10M** • 100W • 12V operation • Simple to use • CW Keyer Built-in • One touch band switching • Direct frequency input • VOX Built-in • Band stacking register • IF shift • 101 memories



IC-V3500 | 144MHz FM Mobile

• 65W of Power for Long Range Communications • 4.5 Watts Loud & Clear Audio • Modern White Display & Simple Operation • Weather Channel Receive & Alert Function



IC-7851 | HF/50MHz Transceiver

• 1.2kHz "Optimum" roofing filter • New local oscillator design • Improved phase noise • Improved spectrum scope • Dual scope function • Enhanced mouse operation for spectrum scope



IC-705 | HF/50/144/430 MHz All Mode Transceiver

• RF Direct Sampling • Real-Time Spectrum Scope and Waterfall Display • Large Color Touch Screen • Supports QRP/QRPP • Bluetooth® and Wireless LAN Built-in



IC-2300H | VHF FM Transceiver

• 65W RF Output Power • 4.5W Audio Output • MIL-STD 810 G Specifications • 207 alphanumeric Memory Channels • Built-in CTCSS/DTCS Encode/Decode • DMS



IC-7300 | HF/50MHz Transceiver

• RF Direct Sampling System • New "IP+" Function • Class Leading RMDR and Phase Noise Characteristics • 15 Discrete Band-Pass Filters • Built-In Automatic Antenna Tuner



IC-7100 | All Mode Transceiver

• HF/50/144/430/440 MHz Multi-band, Multi-mode, IF DSP • D-STAR DV Mode (Digital Voice + Data) • Intuitive Touch Screen Interface • Built-in RTTY Functions

IC-V86 | VHF 7W HT

• 7W Output Power Plus New Antenna Provides 1.5 Times More Coverage • More Audio, 1500 mW Audio Output • IP54 & MIL-STD 810G-Rugged Design Against Dust & Water • 19 Hours of Long Lasting Battery Life • 200 Memory Channels, 1 Call Channel & 6 Scan Edges



IC-7610 | HF/50 MHz All Mode Transceiver

• Large 7-inch color display with high resolution real-time spectrum scope and waterfall • Independent direct sampling receivers capable of receiving two bands/two modes simultaneously



IC-2730A | VHF/UHF Dual Band Transceiver

• VHF/VHF, UHF/UHF simultaneous receive • 50 watts of output on VHF and UHF • Optional VS-3 Bluetooth® headset • Easy-to-See large white backlight LCD • Controller attachment to the main Unit

NEW



IC-T10 | Rugged 144/430 MHz Dual Band

• Disaster Ready - Excellent Fit for Your Emergency Bag • Loud Audio - New Speaker Design • Long Battery Life - Up to 11 Hours • FM Broadcast & Weather Channels



IC-R8600 | Wideband SDR Receiver

10 kHz to 3 GHz Super Wideband Coverage • Real-time Spectrum Scope w/Waterfall Function • Remote Control Function through IP Network or USB Cable • Decodes Digital Incl P25, NXDN™, D-STAR • SD Card Slot for Receiver Recorder



IC-5100 AD VHF/UHF Dual Band Digital Transceiver

• Analog FM/D-Star DV Mode • SD Card Slot for Voice & Data Storage • 50W Output on VHF/UHF Bands • Integrated GPS Receiver • AM Airband Dualwatch

ID-52A | VHF/UHF D-STAR Portable

• Bluetooth® Communication • Simultaneous Reception in V/V, U/U, V/U and DV/DV • Enriched D-STAR® Features Including the Terminal Mode/Access Point Mode • UHF (225~374.995MHz) Air Band Reception



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FTDX101MP | 200W HF/50MHz Transceiver

- Hybrid SDR Configuration • Unparalleled 70 dB Max. Attenuation VC-Tune • New Generation Scope Display 3DSS • ABI (Active Band Indicator) & MPVD (Multi-Purpose VFO Outer Dial) • PC Remote Control Software to Expand the Operating Range • Includes External Power With Matching Front Speaker



FTDX10 | HF/50MHz 100 W SDR Transceiver

- Narrow Band and Direct Sampling SDR • Down Conversion, 9MHz IF Roofing Filters Produce Excellent Shape Factor • 5" Full-Color Touch Panel w/3D Spectrum Stream • High Speed Auto Antenna Tuner • Microphone Amplifier w/3-Stage Parametric Equalizer • Remote Operation w/optional LAN Unit (SCU-LAN10)



FT-991A | HF/VHF/UHF All Mode Transceiver

- Real-time Spectrum Scope with Automatic Scope Control • Multi-color waterfall display • State of the art 32-bit Digital Signal Processing System • 3kHz Roofing Filter for enhanced performance • 3.5 Inch Full Color TFT USB Capable • Internal Automatic Antenna Tuner • High Accuracy TCXO



FTDX101D | HF + 6M Transceiver

- Narrow Band SDR & Direct Sampling SDR • Crystal Roofing Filters Phenomenal Multi-Signal Receiving Characteristics • Unparalleled - 70dB Maximum Attenuation VC-Tune • 15 Separate (HAM 10 + GEN 5) Powerful Band Pass Filters • New Generation Scope Displays 3-Dimensional Spectrum Stream



FT-710 Aess | HF/50MHz 100W SDR Transceiver

- Unmatched SDR Receiving Performance • Band Pass Filters Dedicated for the Amateur Bands • High Res 4.3-inch TFT Color Touch Display • AESS: Acoustic Enhanced Speaker System with SP-40 For High-Fidelity Audio • Built-in High Speed Auto Antenna Tuner



FT-891 | HF+50 MHz All Mode Mobile Transceiver

- Stable 100 Watt Output • 32-Bit IF DSP • Large Dot Matrix LCD Display with Quick Spectrum Scope • USB Port Allows Connection to a PC with a Single Cable • CAT Control, PTT/RTTY Control



FTM-300DR | C4FM/FM 144/430MHz Dual Band

- 50W Output Power • Real Dual Band Operation • Full Color TFT Display • Band Scope • Built-in Bluetooth • WIRES-X Portable Digital Node/Fixed Node with HRI-200



FT-2980R | Heavy-Duty 80W 2M FM Transceiver

- 80 watts of RF power • Large 6 digit backlit LCD display for excellent visibility • 200 memory channels for serious users



FTM-200DR | C4FM/FM 144/430MHz Dual Band

- 1200/9600bps APRS® Data Communications • 2" High-Res Full-Color TFT Display • High-Speed Band Scope • Advanced C4FM Digital Mode • Voice Recording Function for TX/RX



FTM-500DR | C4FM/FM 144/430MHz Dual Band Xcvr

- Front Firing Acoustically Enhanced Speaker System • True Dual Band Operation, C4FM/C4FM Digital D-D Dual Receive • 2.4" High-Resolution Full-Color Touch Panel Display • Built-in High Precision GPS Receiver • Wireless Operation Capability with Optional Bluetooth® Headset

FT-70DR C4FM/FM 144/430MHz Xcvr

- System Fusion Compatible • Large Front Speaker delivers 700 mW of Loud Audio Output • Automatic Mode Select detects C4FM or Fm Analog and Switches Accordingly • Huge 1,105 Channel Memory Capacity • External DC Jack for DC Supply and Battery Charging



FT-5DR C4FM/FM 144/430 MHz Dual Band

- High-Res Full-Color Touch Screen TFT LCD Display • Easy Hands-Free Operation w/Built-In Bluetooth® Unit • Built-In High Precision GPS Antenna • 1200/9600bps APRS Data Communications • Supports Simultaneous C4FM Digital • Micro SD Card Slot



FT-65R | 144/430 MHz Transceiver

- Compact Commercial Grade Rugged Design • Large Front Speaker Delivers 1W of Powerful Clear Audio • 5 Watts of Reliable RF Power Within a compact Body • 3.5-Hour Rapid Charger Included • Large White LED Flashlight, Alarm and Quick Home Channel Access



FTM-6000R | 50W VHF/UHF Mobile Transceiver

- All New User Operating Interface-E20-III (Easy to Operate-III) • Robust Speaker Delivers 3W of Clear, Crisp Receive Audio • Detachable Front Panel Can Be Mounted in Multiple Positions • Supports Optional Bluetooth® Wireless Operation Using the SSM-BT10 or a Commercially Available Bluetooth® Headset



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